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XXXVIII.—*Descriptions and Records of Bees.*—XLIII.  
By T. D. A. COCKERELL, University of Colorado.

*Nomia (Reepenia) eboracina*, sp. n.

♂.—Length about 10 mm.

Black and ferruginous; eyes large; facial quadrangle about twice as long as broad; inner orbits concave above; ocelli large; supra-clypeal area convex; clypeus with a median keel; whole face below antennæ, labrum, and mandibles (except apex) light ochre-yellow; antennæ ferruginous, the flagellum dusky above and more or less so beneath toward apex, only slightly crenulate; tongue long and linear; labial palpi with first joint about as long as next two combined, the last three subequal; maxillary palpi slender, with six subequal joints, the apical ones a little longer than the others; head and thorax with moderately abundant dull white hair; hair of middle of face not hiding surface; mesothorax granular, with very fine shallow punctures; scutellum bigibbous, the prominences with distinct apices; two very obscure stripes on mesothorax, a band along hind margin, and sides of mesothorax and scutellum more or less, dull reddish; tubercles reddish, fringed with dense yellowish-white hair; area of metathorax irregularly rugose, pointed behind in middle; tegulæ moderate for *Nomia*, light amber-colour. Wings rather dusky hyaline,

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with dark stigma and nervures; first r. n. joining second s.m. beyond middle; third s.m. much broader above than second. Legs entirely clear honey-colour, with glittering slightly yellowish hair; hind legs slender, quite normal. Abdomen beneath and the first segment broadly at sides ferruginous; hind margins of dorsal segments broadly reddish hyaline; apex with the two short spines of *Reepenia*; stipites very long and slender, moderately curved, slightly bulbous at end, not hairy; sagittæ long, simple, tapering apically.

*Hab.* Cape York, Queensland, 1909 (*W. W. Froggatt*, 68).

Closely related to *Nomia variabilis*, Friese, of which it is the mainland representative. It could perhaps be regarded as a subspecies of *variabilis*, but since it is quite isolated from the other forms, it seems best to regard it as a species. I now feel convinced that when the mouth-parts and abdominal structures of *Tetralonia brevicornis*, Smith, have been carefully examined that species will also fall in *Reepenia*. From *brevicornis* and *variabilis* the new species is most easily known by the pallid legs. Owing to the coloration of the abdomen there is quite a close superficial resemblance between *N. eboracina* and *N. tomentifera* (Friese).

*Paracolletes crassipes*, Smith.

Professor Froggatt has taken both sexes in New South Wales. Two males before me come from Leura, Jan. 5 and 20, 1903.

Smith described only the female. The male is similar, but less robust, with a thick flagellum which is strongly crenulated beneath, while all the knees, tibiæ, and tarsi are ferruginous. The face is covered with long, pale, ochreous-tinted hair. The abdominal segments are distinctly greenish, with broad reddish hind margins.

*Paracolletes crassipes leptospermi*, subsp. n.

♂.—Length about 12 mm.

Head and thorax black; first abdominal segment black, with the hind margin broadly pale reddish; the other segments dark greenish (the second greenest), with the hind margins broadly ferruginous; face covered with yellowish-white hair; cheeks with long white hair; mouth-parts typically Colletiform; mandibles black, reddish in middle; flagellum long, ferruginous beneath; facial quadrangle much longer than broad; mesothorax and scutellum shining, with

scattered punctures, scutellum bigibbous; hair of mesothorax and scutellum warm fuscous, but of postscutellum, metathorax, and pleura white: area of metathorax very large, smooth and brilliantly shining; teguke ferruginous. Wings faintly dusky, nervures rufo-fuscous; stigma almost obsolete; b. n. falling a very little short of t.-m. Legs more or less reddish, anterior tibiæ clear ferruginous in front.

*Hab.* Mackay, Queensland, Sept. 1898. at flowers of *Leptospermum* (Turner, 308). British Museum.

Exceedingly close to the male of *P. crassipes*, but smaller, with light hair on posterior edge of hind tibiæ (fuscous in *crassipes*); it appears to be a northern subspecies of *P. crassipes*.

*Paracolletes rebellis*, sp. n.

♂.—Length 13 mm. or rather over.

Another species closely resembling *P. crassipes*, but certainly distinct, differing as follows:—The large triangular area of metathorax strongly longitudinally sulcate in the middle and finely transversely striate; the abundant hair of mesothorax and scutellum light ferruginous, not at all fuscous; mandibles red; fourth antennal joint longer; nervures ferruginous; sides of second abdominal segment red basally. The flagellum is very long, ferruginous beneath. The genitalia resemble those of various *Colletes*, except that the very broad stipites are not hairy at the end.

*Hab.* Melbourne, Victoria, Aug. 1900 (*C. French*). Turner collection, British Museum.

In my first arrangement of the specimens I had confused *P. rebellis* with *P. leptospermi*, but it is very different in the structure of the metathoracic enclosure.

*Paracolletes platycephalus*, sp. n.

♀.—Length about 10 mm.

Black, with the abdomen bright ferruginous red, the first segment suffusedly blackish on its anterior face, the second with a conspicuous black spot on each side; head very broad, with white hair, thin on sides of face, abundant on cheeks beneath; clypeus shining, sparsely but strongly punctured, flattened in middle; supraclypeal area elevated, with a flattened smooth triangular face; mandibles dark, bidentate; antennæ black, or flagellum a little reddish apically; flagellum short and thick; mesothorax microscopically tessellate, shining or dullish, rather closely punctured

at sides, but hardly at all in middle; area of metathorax with a strong transverse keel, and above the keel with irregular longitudinal raised lines; hair of tubercles and surrounding parts yellowish, of pleura and metathorax whiter, of mesothorax and scutellum fuscous; tegulæ ferruginous or reddish fuscous. Wings dusky hyaline; nervures and stigma fusco-ferruginous; stigma quite large; b. n. meeting t.-m.; cubital nervure arched upwards; second s.m. small, strongly contracted above, receiving first r. n. toward its end; third s.m. large; second r. n. meeting third t.-c. Legs black, with small joints of tarsi ferruginous; anterior tibiæ stained with ferruginous in front; hair on inner side of tarsi yellowish, on outer side of hind tibiæ long and largely fuscous. Abdomen without hair-bands; hair at apex dark sooty.

*Hub.* Type from Victoria, Feb. 1901 (*C. French*): Turner collection, British Museum. Another from Windsor, Victoria (*C. French*): Froggatt collection, 77.

Resembles *P. fimbriatus* (Smith), but readily separated by the dark legs and venation. By the same characters it is separated from *P. fimbriatus*, Ckll. By the red abdomen, with a spot on each side of second segment, it resembles *P. binuculatus* (Smith), but it differs in the colour of the pubescence, in the legs, &c. The hind spur is very finely pectinate, with many very slender long spines. Superficially *P. platycephalus* looks like the South-American *Perditomorpha bruneri*, Ashm.

*Paracolletes eugeniarum*, sp. n.

♀.—Length about 11 mm.

Unusually narrow; black, with the hind margins of the abdominal segments depressed, broadly whitish hyaline, the part just before the depression reddened; pubescence dull white, but dark fuscous on vertex behind ocelli, and a little fuscous on anterior part of scutellum; head broad, eyes short; mouth-parts typically Colletid; clypeus dullish, obscurely punctured; lower part of supraepical area well punctured; scape black, flagellum bright clear ferruginous beneath except at extreme base; mesothorax shining, rather closely punctured; area of metathorax with five transverse ridges; pleura densely sculptured, partly vertically striate; tegulæ pale amber. Wings hyaline, nervures and stigma dusky ferruginous; stigma very small and slender; b. n. falling a little short of t.-m.; second s.m. quite broad, receiving first r. n. near its base; second r. n. reaching third s.m. a short distance before end. Abdomen shining, the

basal half of the segments very minutely punctured; hair of abdomen thin and white, with scarcely defined bands, hair about apex fuscous; apical plate very broad. The anterior and middle knees are reddened. Hind spur with long strong teeth.

*Hab.* Mackay, Queensland, at flowers of *Eugenia*, Nov. 1899 (*Turner*, 321). British Museum.

*P. eugeniarum* is a rather peculiar species. In my table of Smith's "*Lamprocolletes*" (*Trans. Amer. Ent. Soc.* xxxi. 345) it runs to 10, and the colour of the antennæ suggests that it may be the female of *P. antennatus* (Smith), but the venation is different. It also seems to fall near *P. argentifrons* (Smith), known only from the male; I believe it is really very close to *argentifrons*, but almost certainly not identical, especially as Smith's species comes from Swan River. (For additional notes on *P. argentifrons* see *Trans. Amer. Ent. Soc.* xxxvi. 204.) *P. perfasciatus*, Ckll., is also apparently allied.

The stout teeth of the hind spur in *P. eugeniarum* are very different from the numerous slender spines of *P. platycephalus*. The third s.m. of *P. eugeniarum* is a little broader above than the second, and the third t.-c. strongly bulges outward.

*Gastropsis victoriæ*, Cockerell, var. *a*.

♂.—Abdomen and anterior part of mesothorax with a greenish lustre; mesothorax with much black hair, except on the anterior third, where it abruptly changes to yellowish white; all the hair of second abdominal segment long and white; segments 3 to 5 with narrow and rather inconspicuous white marginal hair-bands; sixth segment with long fuscous hair.

*Hab.* Western Australia, 1909 (*Froggatt*, 47).

This is probably a distinct subspecies, but the original types of *G. victoriæ* had been in some liquid, and the description of the pubescence was defective. More material is needed to show whether there are separable forms in W. Australia, S. Australia, and Victoria.

*Andrena milwankeensis*, Graenicher.

This fine species, described from Wisconsin, has been taken by Miss Eleth Cattell at Garrison, New York.

*Andrena hirticincta*, Provancher.

Woods Hole, Massachusetts (*Eleth Cattell*).

*Andrena carlini*, Cockerell.Garrison, New York (*Eleth Cattell*).*Andrena cratægi*, Robertson.Garrison, New York (*Eleth Cattell*).*Andrena rugosa*, Robertson.Garrison, New York (*Eleth Cattell*).*Andrena flavoclypeata*, Smith.Garrison, New York (*Eleth Cattell*).*Andrena forbesii*, Robertson.Garrison, New York (*Eleth Cattell*).*Andrena thaspîi*, Graenicher, var. *a*.Foley's yard, Bloomington, Indiana, at cherry blossoms (*Max M. Ellis*).

Differs from typical *A. thaspîi* by having the facial foveæ strongly reddish and the mesothorax entirely dull. This may perhaps be identical with *A. mandibularis*, Rob., which I know only from description, but Robertson does not state whether the foveæ of that species are reddish. Viereck, in *Eutom. News*, 1907, p. 287, makes *thaspîi* a synonym of *mandibularis*, but in the separate copy he sent me he has erased *mandibularis*, leaving *thaspîi* as valid.

*Colletes inæqualis*, Say.

Bloomington, Indiana; six females at flowers of wild crab-apple trees on Campus of University of Indiana (*Max M. Ellis*). On the same flowers, in the same locality, Dr. Ellis collected males of *Xylocopa virginica*, Drury.

*Prosopis chromatica* (Cockerell).

I described this from the female as a variety of *P. albonitens*, Ckll. The male (Mackay, Nov. 1891, *Turner*, 713 in part) shows that it is a distinct species, for it has wholly dark mandibles and the broader face is ivory-white, contrasting with the pale yellow tubercles, while the lateral

face-marks are broader at base, regularly tapering to a sharp point. Mr. Turner took both *P. albonitens* and *P. chromatica* at flowers of *Xanthorrhoea*.

*Allodape simillima*, Smith.

Smith described the female. Two males come from Mackay, Queensland, January 1899 and 1900 (*Turner*, 716). They are 7 to 7½ mm. long, like the female, but with the eyes very large, face narrowed below; clypeus ivory-white, constricted in middle; almost linear lateral face-marks; a large white spot on labrum; middle and hind basitarsi white.

Mr. Turner also took *A. unicolor*, Smith, at Mackay (March 1900).

*Pachyprosopis obesa*, sp. n.

♀.—Length about 7 mm.

Head and thorax very robust; abdomen large and broad, though rather short; head and thorax black, without light markings; mandibles dark reddish; scape clear reddish orange; flagellum short and thick, ferruginous, suffusedly dusky above; clypeus and supraclypeal area shining, with scattered punctures; front also shining, but with much finer and closer punctures; facial foveæ very distinct, linear, ending below at about level of middle of scape, and above curving over to the lateral ocelli; ocelli rather small; mesothorax and scutellum nude, shining, with scattered small punctures, which are closer on hind part of mesothorax and on scutellum; tubercles with a fringe of dull white hair; pleura not hairy; area of metathorax triangular, without evident sculpture; all the tibiæ and tarsi bright ferruginous, as also anterior femora at apex, middle femora except beneath, and hind femora entirely; tegulæ piceous. Wings dusky hyaline; stigma and nervures yellowish brown; b. n. strongly arched, falling far short of t.-m.; first r. n. meeting first t.-c.; second s.m. more or less wedge-shaped, higher than long, produced to a point above. Abdomen dull dark ferruginous, with variable transverse dusky clouds on the segments.

*Hab.* Sydney, New South Wales, Nov. 29, 1910 (*W. W. Froggatt*, 127); 2 ♀.

A very distinct species, known from all others by its thick and wholly black head and thorax, combined with an orange scape and a red abdomen.



*Pachyprosopis nitidiceps*, sp. n.

♀.—Length about  $4\frac{1}{2}$  mm.

Black, not more robust than *Euryglossa*; head nearly round seen from in front, not especially large, brilliantly shining, with scattered punctures; ocelli small; front with a median groove; mandibles dark, obscurely reddish subapically; eyes converging below; scape black; flagellum short and thick, ferruginous beneath; mesothorax dullish, with inconspicuous scattered punctures; scutellum rather more shining, having a sort of glaucous tint; area of metathorax not distinctly defined. Legs black, with the tarsi reddish, the anterior tibiæ ferruginous, suffused with blackish behind, and the middle tibiæ ferruginous in front, the hind knees also ferruginous; tegulae rufo-testaceous. Wings hyaline, faintly dusky, the large stigma and the nervures ferruginous; b. n. strongly arched, not reaching t.-m. : first r. n. meeting first t.-c.; second s.m. narrow and pointed above, yet broader (longer) than in some species, its lower side being about equal to that on first t.-c.; abdomen broad, shining, the hind margins of the segments brownish. The compound microscope brings out the following details:—Abdominal segments finely transversely lineolate; base of metathorax with a very irregular and delicate raised reticulation; scutellum closely punctured posteriorly; hind spur with very strong teeth; mesothorax very minutely transversely lineolate.

*Hab.* Mackay, Queensland, November 1893 (*Turner*). British Museum.

Readily known by the small size and black colour; *P. flavicauda*, Ckll., which it most resembles, has the end of the abdomen orange.

*Halictus punctatus*, Smith.

In Smith's description read "mesothorax (not metathorax) green." The metathorax is black, with fine raised lines. The abdomen varies to nearly all red except the base. The specimens before me are labelled as follows:—Sydney, N.S.W., Nov. 29, 1910 (*Froggatt*, 124); Rutherglen, Victoria, 1909 (*French*; Froggatt collection, 88); Melbourne, Victoria, Aug. 1900 (*French*; Turner collection).

*Halictus dotatus*, sp. n.

♀.—Length about  $5\frac{1}{2}$  mm.

Head and thorax green, abdomen and legs bright ferruginous; head ordinary, metallic green, not very bright;



labrum, mandibles, and lower margin of clypeus light ferruginous; front dull and minutely granular; scape slender, light ferruginous; flagellum ferruginous beneath; mesothorax very bright green, shining, very finely punctured; scutellum shining, rather more brassy; metathorax dark bluish green, the area with fine wrinkles, those about the middle transverse; pleura coloured like metathorax. Legs entirely light ferruginous, hind spur simple; tegulae light rufo-testaceous. Wings clear; stigma and nervures honey-colour, the stigma large. Abdomen shining ferruginous, with slight transverse dusky clouds, but base not dark.

*Hab.* Sydney, New South Wales, Nov. 29, 1910 (*Froggatt*).

The type is gummed on a card with a specimen of *H. punctatus*; they were probably taken at the same spot. *Halictus dotatus* is related to *H. vitripennis*, Smith, but the scape is red and the base of the abdomen is not black. The red lower part of clypeus is also distinctive. The mesothorax is more shining and much brighter green than in *H. eyrei*, Ckll.

*Halictus dampieri*, Cockerell.

A new locality is Kuranda, Cairns, Queensland, Dec. 1901 (*Turner*). A long series of females taken by Mr. Turner at Mackay is all from flowers of *Eugenia*, except one from *Cassia*.

*Halictus behri transvolans*, subsp. n.

♀.—Clypeus yellowish green varying to blue-green; supraclypeal area brass-colour or concolorous with the front and sides of face; mesothorax peacock-green; scutellum brassy green varying to peacock-green; abdomen shining dark green; scape black, with a minute red spot at extreme base; underside of flagellum wholly pale ferruginous.

*Hab.* Mackay, Queensland, March 1900 and Jan. 1890 (*Turner*, 757).

Close to *H. flindersi*, Ckll., and having the same ventral scopa on abdomen and transverse lineolation in front of anterior ocellus, but easily separated by the ferruginous (variously infuscated) tibiae and tarsi. The type is in the British Museum.

*Halictus forresti*, Cockerell.

Five males before me, taken by Mr. Turner at Mackay, are all from flowers of *Eucalyptus* in March.

*Halictus sturti*, Cockerell.

Ten females are before me, taken at Mackay by Mr. Turner; eight are from flowers of *Cassia* in December, two were collected in March without flower record.

*Halictus urbanus*, Smith.

Sydney, N.S.W., Dec. 1, 1910 (*Froggatt*, 114).

*Halictus inclinans*, Smith.

Windsor, Victoria, 1909 (*French*; Froggatt collection, 90).

This species and the last are both said by Smith to come from Champion Bay.

*Halictus saycei*, sp. n.

♀.—Length  $4\frac{1}{2}$ –5 mm.

Form ordinary, thorax small; black, with the dull and granular mesothorax dark green; the abdomen smooth and shining, with very little hair, and wholly without bands; mandibles, knees, tibiæ (middle and hind ones more or less infuscated), tarsi, and extreme apex of abdomen ferruginous; scape slender, red basally; flagellum dark; tegulæ shining apricot-colour. Wings hyaline, venation of *Chloralictus*, stigma rather dilute brown, nervures paler, second s.m. receiving first r. n. a short distance from its end; tubercles partly reddish; area of metathorax granular, shining apically; hind spur with about three short nodule-like teeth. Ventral side of abdomen with a well-developed scopa of curled hairs. The compound microscope shows the following:—Front finely striate, no transverse striæ below ocelli; mesothorax roughened and punctured, anteriorly very finely, rather obliquely, transversely lineolate; basal part of metathoracic area with vermiform rugæ, apical part microscopically tessellate; abdomen transversely lineolate; hairs of caudal rima pale orange, beautifully plumose.

*Hab.* Mackay, Queensland, April 1900, 2 ♀ (*Turner*, 7 c). British Museum.

Resembles the Tasmanian *H. limatus*, Smith, but differs in the sculpture of the thorax.

*Hulicius kestereni*, sp. n.

♂.—Length 4– $4\frac{1}{2}$  mm.

Head and thorax dark green, metathorax blue, abdomen shining black, without bands; clypeus and supra-clypeal area

shining, but front and mesothorax dull; mandibles bright red at apex, orange in middle, dark at base; labrum and margin of clypeus dark; antennæ comparatively short and thick, like those of a female; scape black, flagellum dull ferruginous beneath; scutellum shining green; area of metathorax shining, with irregular rugæ not covering the surface; tegulæ testaceous. Wings clear, nervures and stigma reddish sepia; venation of *Chloralictus*, but first r. n. entering extreme base of third s.m. Legs black, with the knees, anterior tibiæ, apices of the other tibiæ, and all the tarsi ferruginous. Abdomen only moderately narrow. The compound microscope shows:—Front very minutely cancellate, not striate; mesothorax coarsely lineolate or subtessellate, with scattered punctures.

*Hub.* Kuranda, Cairns, Queensland, March 1902 (*Turner*). British Museum. Also a co-type from Cape York, May 1902 (*Turner*).

Superficially much like *H. saycei*, but the differences in colour and sculpture show that it cannot be its male.

*Halictus paracolletinus*, Cockerell.

A male from Kuranda, Cairns, April 1902 (*Turner*), shows that this sex resembles the female, with the following principal sexual differences:—Face much narrower, front and sides of face densely covered with orange hair; lower half of clypeus and a wedge reaching upper margin pale yellow; antennæ very long, flagellum ferruginous beneath; anterior knees, tibiæ, and tarsi ferruginous, the tibiæ clouded with dusky.

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XXXIX.—*The Anatomy and Classification of the Symbranchoid Eels.* By C. TATE REGAN, M.A.

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[Plate IX.]

IN most recent systems of classification the Symbranchii appear as an order (or suborder) which is placed near the Apodes. It seems probable, however, that they are derived from some group of acanthopterous physoclists and that the resemblances to the true Eels are not due to relationship, since in *Alabes* the præmaxillaries have long posterior